

or shorter prominent algæ should be kept and noted, and crusts on such examined and preserved, with notes of the vessel's course.

33. Various instances have been mentioned by travellers of the coloration of the sea by minute algæ as in the Straits of Malacca by Harvey; any case of this kind would be worth especial attention.

34. The calcareous algæ (*Melobesia*, &c.) are comparatively little known, and are apt to be overlooked.

35. Fresh-water algæ should be collected as occasion presents. Prof. Dickie states that they may be either dried like the marine kinds, or preserved in a fluid composed of 3 parts alcohol, 2 parts water, 1 part glycerine, well mixed.

36. Cases are recorded of the presence of algæ in hot springs. If such are met with, the temperature should be noted and specimens preserved.

IV. Zoological Observations

As the scientific director of the expedition is an accomplished zoologist, and has already had much experience in marine exploration, it will suffice to offer a few suggestions under this head.

The quadrant-like zone of the Pacific, which separates the northern and eastern boundaries of the Polynesian Archipelago (using "Polynesia" in its broadest sense as inclusive of "Micronesia") from the coasts of N. Asia and America, is as little explored from the point of view of the physical geographer as from that of the biologist. It would be a matter of great importance to examine the depth, and the nature of the deep-sea fauna, of this zone by taking a line of soundings and dredgings in its northern half (say between Japan and Vancouver) and in its eastern half (say between Vancouver and Valparaiso). If practicable, it would further be very desirable to explore the littoral fauna of Waihou, Easter Island, or Sala y Gomez, with the view of comparing it critically with that of the west coast of South America.

If H.M.S. *Challenger* passes through Torres Straits, it will be very desirable to examine the littoral fauna of the Papuan shore of the straits in order to compare it with that of the Australian shore. The late Professor Jukes, in his "Voyage of the *Fly*," many years ago, directed attention to this point and to its theoretical bearings.

The hydrographic examination of "Wallace's line" in the Malay archipelago, and of the littoral faunas on the opposite sides of that line, is of great importance, considering the significance of that line as a boundary between two distributional provinces. An additional interest has been given to the exploration of this region by Capt. Chimmo's recently obtained sounding of 2,800 fathoms in the Celebes Sea, the mud brought up being almost devoid of calcareous organisms, but containing abundant spicula of sponges and radiolaria.

The light from any self-luminous objects met with should be examined with a prism as to its composition. The colours of animals captured should also be examined with a prism, or by aid of the microscopic spectroscope.

V. Concluding Observations

Attention should be paid to the Geology of districts which have not hitherto been examined, and collections of minerals, rocks, and fossils should be made. Detailed suggestions as to the duties of the geologist accompanying the expedition are unnecessary; but it seems desirable that at all shores visited, evidence of recent elevation or subsidence of land should be sought for, and the exact nature of these evidences carefully recorded.

Every opportunity should be taken of obtaining photographs of native races to one scale; and of making such observations as are practicable with regard to their physical characteristics, language, habits, implements, and antiquities. It would be advisable that specimens of hair of unmixed races should in all cases be obtained.

Each station should have a special number associated with it in the regular journal of the day's proceedings, and that number should be noted prominently on everything connected with that station; so that in case of labels being lost or becoming indistinct, or other references failing, the conditions of the dredging or other observations may at once be forthcoming on reference to the number in the journal. All specimens procured should be carefully preserved in spirit or otherwise, and packed in cases with the contents noted to be dealt with in the way which

seems most likely to conduce to the rapid and accurate development of the scientific results of the expedition.

A diary, noting the general proceedings and results of each day, should be kept by the scientific director, with the assistance of his secretary; and each of the members of the scientific staff should be provided with a note-book in which to enter from day to day his observations and proceedings; and he should submit this diary at certain intervals to the scientific director, who would then abstract the results, and incorporate them, along with such additional data as may be supplied by the officers of the ship, in general scientific reports to be sent home to the hydrographer at every available opportunity.

The scientific staff should be provided with an adequate set of books of reference, especially those bearing on perishable objects.

SCIENTIFIC SERIALS

A LARGE portion of the *American Naturalist*, for October, is occupied by Prof. Asa Gray's address at the Dubuque meeting of the American Association for the Advancement of Science, to which we have already alluded. Mr. B. Pickman Mann then concludes his paper on the white coffee-leaf miner (*Crematogaster coffeolum*), a subject of great importance to coffee-growers, treated in an exhaustive manner. Prof. C. F. Hartt, from whom articles on the same subject have already appeared in the *Naturalist*, contributes a further paper on the occurrence of Face-urns in Brazil; and Prof. N. S. Shaler concludes his article on the Geology of the Island of Aquidneck, illustrated by maps and sections; and Mr. C. V. Riley his important article on the cause of Deterioration of Grape-vines.—The November number commences with an article by Mr. J. G. Henderson on some aboriginal relics known as "plummets," which are abundant in various parts of the United States from the Atlantic to the Pacific, with speculations as to their use. Prof. James Orton continues his contributions to the Natural History of the Valley of Quito, the present article being devoted to the Articulata and Plants; in the latter department the author notices the similarity of the features of the flora of the Andes to those recorded by Kerner in the Tyrolean Alps. Mr. R. Ridgway commences some Notes on the Vegetation of the Lower Wabash Valley, with an account of the Forests of the Bottom-lands. Mr. Samuel H. Scudder, in an article on Fossil Insects from the Rocky Mountains, records nearly 40 species, belonging to nearly all the principal groups, found in Tertiary deposits. Prof. Cope, in a paper read at Dubuque, discusses the geological age of the Coal of Wyoming, which he refers without doubt to the Cretaceous period. Prof. Shaler has a short note on the effects of extraordinary seasons on the distribution of Animals and Plants.—In the number for December we find a short article by the Rev. Samuel Lockwood on the Baltimore Oriole and Carpenter-bee, followed by a continuation of Mr. Ridgway's notes on the Vegetation of the Lower Wabash Valley, treating of the Peculiar Features of the Bottom-lands. This is followed by an interesting account of the Alpine Flora of Colorado, by the Rev. E. L. Greene; and Dr. J. W. Foster then contributes an abstract of a paper read at Dubuque on certain peculiarities in the Crania of the Mound-builders, illustrated with drawings. Another Dubuque paper of a speculative character is by Dr. H. Hartsborne, on the relation between organic vigour and sex; and Prof. Shaler then gives a further instalment of his paper on the Geology of Aquidneck. In all these three numbers is the usual amount of Reviews, and interesting short paragraphs and notes.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, Jan. 23.—Dr. Stenhouse read a paper, "Contributions to the History of the Orcins.—No. III. Amido-derivatives of Orcin." He has confined his investigations to an examination of the products obtained from Trinitro-orcinic acid.

Amido-diimido-orcin, $C_7H_5(NH_2)(NH)_2O_2$.—This compound, which has the properties of a base, is formed by the oxidation of triamido-orcin, and is most conveniently obtained in a pure state by decomposing a solution of the acetate with a slight excess of ammonia. The most advantageous method of preparing the base is to reduce trinitro-orcin with sodium-amalgam, and to

oxidise the alkaline solution of triamido-oricin by exposure to the air. Trinitro-oricin is also reduced by treatment with tin and hydrochloric acid, or zinc and hydrochloric or sulphuric acid.

Amido-diimido-oricin hydrochloride.—The hydrochloride obtained in the preparation of amido-diimido-oricin may be purified by crystallisation from hot water; but as heat decomposes solutions of the salts of this base, it is better to precipitate a cold solution of the acetate by a slight excess of hydrochloric acid, in which the hydrochloride is but slightly soluble; the precipitate should be thoroughly washed with alcohol, pressed and dried.

Amido-diimido-oricin sulphate is readily prepared by precipitating a dilute solution of the acetate with sulphuric acid, when it forms minute lustrous plates which are purple by reflected light.

Amido-diimido-oricin nitrate is prepared, like the sulphate, by adding a slight excess of nitric acid to a moderately strong solution of the acetate and washing the precipitate with alcohol.

Amido-diimido-oricin acetate dissolves readily in acetic acid, and on carefully evaporating the solution at a low temperature, the acetate is obtained in ill-defined crystalline plates having a purple iridescence. It is readily soluble in cold water, but only slightly soluble in glacial acetic acid.

Amido-diimido-oricin oxalate.—Very slightly soluble purple scales obtained by precipitating a solution of the acetate with oxalic acid.

Amido-diimido-oricin picrate.—On adding a solution of picric acid to a dilute solution of amido-diimido-oricin acetate and washing the precipitate with alcohol, the picrate is obtained in iridescent green needles and plates. It is insoluble in alcohol, and but slightly soluble in water.

Prof. Owen read a paper "On the Fossil Mammals of Australia.—Part VIII. Family *Macropodidae*; Genera *Macropus*, *Osphranter*, *Phascolagus*, *Sthenurus*, and *Protemnodon*."

In the present part of the series of papers on the fossil mammals of Australia, the author enters upon the description and determination of the fossils referable to the family of Kangaroos (*Macropodidae*); restricting, however, the latter term to the species in which the molar teeth have two transverse ridges for the chief character of their grinding-surface, and excluding the Potoroos (*Hipsiprymna*), in which the working-surface of the molars is formed by four tubercles in two transverse pairs. The large extinct species of Kangaroo indicated under the names *Macropus Titan*, *M. Atlas*, and *M. Anak* in former publications here receive further elucidation of their specific distinction from any known living Kangaroos and of the grounds (according to the value assigned thereto by present zoologists) for referring two of these (*M. Atlas*, *M. Anak*) to distinct subgenera of *Macropodidae*. The author then enters on the elucidation, aided by the facts premised, of *Macropus Titan*, *M. affinis*, *Osphranter Cooperi*, *O. Gouldii*, *Phascolagus altus*, *Sthenurus*, *Atlas S. Brehms*, *Protemnodon Anak*, *P. Og*, *P. Mimas*, and *P. Rachus*. The maxillary, mandibular, and dental characters of these extinct species are illustrated by the subjects of eight plates.

Zoological Society, January 21, Prof. Newton, F.R.S., V.P., in the chair.—Dr. Günther, F.R.S., exhibited and made remarks on a supposed ancient Egyptian skull.—A communication was read from the Rev. John T. Gulick, containing remarks on the classification of the family *Achatinellinae*; which he regarded as containing ten well established genera, seven of which were arboreal and three terrestrial in habit.—Mr. A. H. Garrod, read a paper on the visceral anatomy of the Sumatran rhinoceros (*Ceratotherium sumatrensis*) based on a specimen of this species lately living in the Society's gardens.—Mr. A. D. Bartlett gave an account of the birth of a Sumatran rhinoceros which had taken place on board the *Orchis* at the Victoria Docks on December 7. The mother and an adult male of the animal along with her had been brought from Singapore, but the male had died on the passage. The young one suckled freely and lived for about a fortnight, and was said to have been accidentally killed.—A communication was read from Surgeon-Major Francis Day on some new or imperfectly known fishes of India and Burma.—A communication was read from the Rev. O. P. Cambridge on some new genera and species of Araneidea, chiefly from Mr. Thwaites' Ceylonese collections.—A communication was read from Dr. J. E. Gray containing a description of the skeleton of the New Zealand Right Whale (*Macleanius australiensis*) and of other whales. Dr. Gray concluded with a general list of the known species of the marine mammalia of New Zealand.—A communication was read from Mr. G. B. Sowerby, giving de-

scriptions of several new shells of the genus *Conus*.—A communication was read from Dr. J. C. Cox, containing descriptions of new land shells from Australia and the Solomon Islands.

Anthropological Institute, Jan. 21. Annual general meeting.—Sir John Lubbock, Bart, F.R.S., president, in the chair. The Report of Council showed that the income for 1872 was 1,238*l.* 5*s.* 4*d.*, and the expenditure 1,084*l.* 18*s.*, leaving a balance in hand of 153*l.* 7*s.* 4*d.*; and that after deducting the expenses of the year, the debt of the Institute had been reduced by 249*l.* 9*s.* 6*d.* The president delivered an address, in which he reviewed the chief anthropological works of the past year by continental and American authors. He also drew attention to the continued destruction of prehistoric monuments, and made further suggestions for their preservation. Prof. George Busk, F.R.S., was elected president.

Meteorological Society, Jan. 15.—Dr. Tripe, president, in the chair. The first paper read was on solar radiation, by Rev. Fenwick W. Stow, M.A. This paper treated of the comparison of the measure of solar radiation obtained by a Herschel's actinometer with that indicated by the difference between the temperature of a blackened bulb *in vacuo*, and that of the air in the shade; the comparison of the latter with the difference of temperature of blackened and unblackened bulbs *in vacuo*; suggestions for a standard solar thermometer or actinometer; errors of thermometers *in vacuo*, and the necessity of comparing them; experiments with blackened bulbs in glass air-jackets; and the objects to be aimed at in investigations of solar radiation, and the importance of such investigations to meteorology and physics. The next paper, also by the Rev. F. W. Stow, entitled "On Temperature in Sun and Shade," was an account of experiments with different thermometers exposed (1) to full sun, (2) to sun, but not to sky in zenith, (3) to sky in zenith, but not to sun, (4) on open thermometer stand, and (5) in louver board screen. The author found that ordinary mercurial thermometers are affected more by radiation from the ground than from the other sources of heat; and concluded with some remarks on open stands and louver board screens.—The other communications read were—"On the 'Pocky' Cloud observed July 27, 1872," by J. S. Harding, F.M.S.; "Account of the Hurricane which passed over the Nichol Bay district of Western Australia on March 20, 1872," by R. J. Sholl, Government Resident; and an "Account of a phenomenon observed on board H.M.S. *Fawn*, on May 16, 1872," by H. P. Kneivitt.

Institution of Civil Engineers, Jan. 14.—Mr. Thomas Hawksley, president, in the chair. Colonel W. H. Greathed, C.B., R.E., Chief Engineer of Irrigation to the Government of the North-Western Provinces, read a paper "On the Practice and Results of Irrigation in Northern India." The object of the Paper was to describe what had been done and what was now doing in that portion of Upper India where irrigation had been longest practised, and on the largest scale.

GLASGOW

Geological Society, Jan. 9.—James Bryce, LL.D., F.G.S., read a paper on "The Upper Secondary Rocks of Sky and Raasay." After referring to the observations which have previously been published on the Lias and Oolite of Sky, Dr. Bryce noticed the great geological interval which separates these upper Secondary rocks in Scotland from the deposits on which they rest. In the east of Scotland they are found overlying the Old Red sandstone; but in Skye and Raasay their base is formed of the Torridon or Cambrian Sandstone, in a great trough or hollow, in which they seem to have been deposited. He then described at length the general succession of beds observed in Skye, from the lower Lias at Lucy Bay to the middle Lias at Broadford, Pabba, and Raasay, and the upper Lias and inferior Oolite in the neighbourhood of Portree. Passing northwards these were succeeded by beds still higher in the scale, till, at Loch Staffin on the one side, and Uig on the other, members of the upper Oolite were found. He had also found indications of what appeared to be the equivalents of the "Purbeck beds" in England, and the fossils from these were now under careful examination. The paper was illustrated by maps and carefully-prepared sections, together with a tabular view of the beds referred to, and a copious list of the fossils belonging to each horizon, including some new species not yet named.

CALIFORNIA

Academy of Sciences, Dec. 17, 1872.—Mr. W. H. Dall read, "Preliminary Descriptions of new Species of Mollusca from the N. W. coast of America." The *Magasella Aleutica* (Dall, n. s.), has its *habitat* in the Aleutian Islands from Akutan Pass to the Shumagins, attached to the under surface of rocks at extremest low water of spring tides. This pretty species resembles in miniature *Laguneus rubella* of Sowerby, but is proportionately shorter and broader. The animal is rather sluggish. *Acmea (Colisella) peramabilis* (Dall, n. s.), inhabits the Shumagin group of islands, Alaska Territory, on rocks near low water mark. This lovely species has no relations with *A. sybaritica*, Dall, and *rosacea*, Cpr., except those of colour. The two latter are much smaller and the rose colour is much lighter and differently disposed. Its nearest allies are some varieties of *A. patina*. *Argonauta expansa* (Dall, n. s.) The interior of the shell is smoothly polished, the exterior, especially on the protuberances of the carinae, is covered with a multitude of exceedingly minute rough pustules, which give a very rough, harsh feel to the shell, and under a lens appear hemispherical. Laying the shell upon its aperture, with the apex posterior, we have the following measurements. Total length 3.25 in. Width of dorsal area posteriorly 0.32 in.; ditto, anteriorly 0.7. Height of shell 2.0 in. Total extension of axis from end to end, 4 in. Total length of aperture 2.25 inches; length from the anterior edge of the spire to the anterior edge of the aperture 1.9 in. *Habitat*, in the Gulf of California. This pretty and peculiar argonaut possesses an assemblage of characters not common to any described species, though there are several which have a somewhat similar lateral extension of the axis.

PARIS

Academy of Sciences, January 20.—M. de Quatrefages, president, in the chair. The President announced the death of M. le Baron C. Dupin, member of the Mechanical Section.—M. Chasles read a paper on the number of points of intersection of two curves of any order at a finite distance.—M. Cahours read a note on certain new derivatives of Propyl. The bodies described were propylic sulphide, mercury propyl, tin propyl, and nitro-propane; the author finds that propylic iodide, which occupies a place between the iodides of ethyl and amyl, behaves like them.—M. A. Trécul read the first part of a paper on the carpellary theory of the *Papaveraceae*. This part of the paper was devoted to the Papaver family.—An account of some new researches on the tympanic chord, by M. A. Vulpian, followed.—M. A. Dumont sent a paper on the possibility of destroying the Phylloxera in the Valley of the Rhone by submerging the vines.—M. du Pepin sent a note on the residues of the fifth power and one on the quadratic forms of certain powers of the primary numbers.—M. O. Tamin-Despallès sent a note on the connection between ozonometric determinations and the death-rate of Paris. The author finds that the winds from south to north round by west are favourable to health, and that large ozone indications are accompanied by small death-rates.—M. Yvon Villarcéau read a letter from M. Borrelly detailing some observations of No. 128, and the discovery of a new variable star. The latter is situated in the Balance; its mean position for 1873 is, $15^{\text{h}} 14^{\text{m}} 5^{\text{s}} 69^{\text{s}}$ R. A.; $109^{\circ} 55' 42''$ N. P. D.—M. P. Volcicelli sent his fifteenth note on the "Electric Influence."—M. Ch. Viollette sent a note in reply to the late communication of Messrs. Tomlinson and Van der Mensbrugghe on the action of thin films of liquid on supersaturated solutions. He asserts that the ten-atom sodic sulphate crystal always caused the solidification of the solution of that salt, and that it does this of itself, and not by means of its chemical dirtiness.—M. Arm. Gautier sent a note on certain phosphorous compounds, in which that body appears to exist in the amorphous form. The formula for one of these bodies is $\text{P}_5 \text{H}_3 \text{O}$; it is formed by the action of water on PI_2 .—M. A. Chevalier sent a note on the modifications produced on coloured light by the various tinted glasses used for spectacles. He decides that as the neutral tint alone cuts out the very brilliant red and yellow portions of the spectrum that it alone is of any use.

DIARY

THURSDAY, JANUARY 30.

ROYAL SOCIETY, at 8.30.—Note on the Origin of Bacteria, and on their Relation to the Process of Putrefaction: Dr. Bastian.—On just Intonation in Music: R. H. M. Bosanquet.—On the Composition and Origin of the Waters of a Salt Spring in Huel Seton Mine, with a Chemical and Microscopical Examination of certain Rocks in its Vicinity: J. A. Phillips.

SOCIETY OF ANTIQUARIES, at 8.30.—Oriental Bronze Implements: A. W. Franks.

FRIDAY, JANUARY 31.

ROYAL INSTITUTION, at 9.—Music of the Future: Mr. Danbreyther. SOCIETY OF ARTS, at 8.—Progress of India during the last Fourteen Years: J. H. Stocqueler.

SATURDAY, FEBRUARY 1.

ROYAL INSTITUTION, at 3.—On Comparative Politics: E. A. Freeman.

SUNDAY, FEBRUARY 2.

SUNDAY LECTURE SOCIETY, at 4.—The Early History of Domestic Animals: L. C. Miall.

MONDAY, FEBRUARY 3.

ROYAL INSTITUTION, at 2.—General Monthly Meeting.

ENTOMOLOGICAL SOCIETY, at 7.

ASIATIC SOCIETY, at 3.

LONDON INSTITUTION, at 4.—Physical Geography: Prof. Duncan.

TUESDAY, FEBRUARY 4.

ROYAL INSTITUTION at 3.—Forces and Motions of the Body: Prof. Rutherford.

SOCIETY OF CIVIL ENGINEERS, at 8.

ANTHROPOLOGICAL INSTITUTE, at 8.—On the Looshais: A. Campbell.—The Inhabitants of Car Nicobar: A. L. Distant.

SOCIETY OF BIBLICAL ARCHAEOLOGY, at 8.30.—On the Era of Ezra and Nehemiah: Dr. H. Haigh.—On an Assyrian Patera with an Inscription in Hebrew Characters—Rev. J. M. Rodwell.—Some Remarks upon a Passage in the Pænelus of Plautus: Rev. J. M. Rodwell.

ZOOLOGICAL SOCIETY, at 8.30.—On a certain Class of Cases of Variable Protective Colouring in Insects: B. Meldola.—Report on the Hydroids collected during the Expeditions of H. M. S. Porcupine: Prof. Allman.—Measurements of the Red Blood Corpuscles of Batrachians: G. Gulliver.—Notes on some Reptiles and Batrachians obtained by Dr. Adolf Bernhard Meyer in Celebes and the Philippine Islands: Dr. Günther.

WEDNESDAY, FEBRUARY 5.

LONDON INSTITUTION, at 7.—Fresco and Siliceous Painting: Prof. Barff.

SOCIETY OF ARTS, at 8.

GEOLOGICAL SOCIETY at 8.

MICROSCOPICAL SOCIETY, at 8.—Anniversary.

THURSDAY, FEBRUARY 6.

CHEMICAL SOCIETY, at 8.—On Anthrapurpurin: W. H. Perkin.—On the Solidification of Nitrous Oxide: T. Wills.—On Isomerism in the Terpene Family: Dr. C. A. Wright.

BOOKS RECEIVED

ENGLISH.—Lectures on the Philosophy of Law: J. H. Stirling (Longmans).—The Botanist's Pocket-Book: W. R. Hayward (Bell & Daldy).—The School Manual of Geology. Second Edition: Jukes Browne (A. & C. Black).—History of Bokhara: A. Vambéry (H. S. King & Co.).—Ozone and Antozone: Dr. C. B. Fox (J. and A. Churchill).

FOREIGN.—Reisen in der Philippinen: F. Jäger. (Berlin.)

PAMPHLETS RECEIVED

ENGLISH.—National Education and New School Boards: Thomas Bonnar. Quarterly Weather Report of the Meteorological Office, No. 14, Part 2, April to June, 1871.—Journal of the Women's Education Union, No. 1, January, 1873 (Chapman & Hall).—Report of the Kew Committee for fifteen months, ending October 31, 1872.—Quarterly Journal of Science, No. 37, January 1873.—On the Genetic Relation of Cetaceans and the Methods involved in Discovery: Theodore Gill.

FOREIGN.—Zeitschrift für Meteorologie, No. 1, Vol. viii. January 1873.—Über den Von Pogson, am 2 December, Aufgefunden der Komete Von Prof. Theodore V. Oppalzer.

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